THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Centre for the Philosophy of Natural and Social Science

Report on the Sound Pad Project: The Co-Creation of Breakdancing, Dance Education and Technology

Rationale Method, Sheffield

Simon Hayhoe and Nathan Geering

Contents

Abstract

A co-creation project for sighted dancers and choreographers and people with visual impairment was designed, implemented and evaluated using a combination of participatory and grounded methodology, a practice framework of rationale method and a model of inclusive capital. The project had the following objectives: 1) to develop a participatory dance technology, collaborative choreography and a method of teaching dance; 2) to encourage people with visual impairments to move more; 3) to provide people with visual impairments with a greater understanding of dance; and 4) to examine the encouragement of performative arts. The evaluation found that participants developed new negotiated forms of information and inclusive technical capital / inclusive capital. In addition, visually impaired participants developed unique dance sequences creatively through touch, sound and residual vision, and communicated this *vision* to sighted dancers in an effective way. The technology and rationale method developed during this process also appeared to have helped this process of communication.

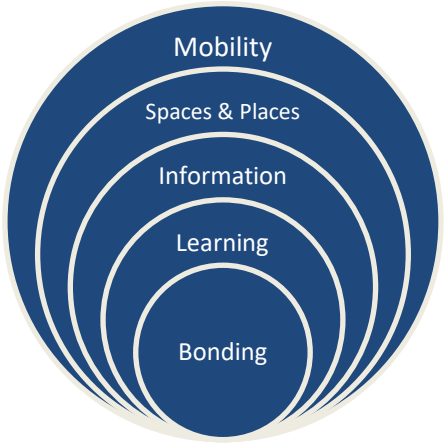
1 Introduction

1.1 Terms Used Throughout the Report

Terms used throughout the report include:

- **Sound Pad** – A digital instrument that allows the user to create music, record sounds as samples and play samples of music. These devices are usually a set of buttons or slides for manipulating sounds.
- **Rationale Method** - a theory of expressing dance movements through onomatopoeic sounds in order to develop a sense on embodied expression, a sense of self in the surrounding space and safer, more stable mobility.
- **Participatory and Grounded Methodology** - a research and educational methodology for co-creating teaching and learning outcomes with all forms of learners. The methodology is in three stages, incorporating evaluation and practice.
- **Inclusive Technical Capital / Inclusive Capital** - the theory of developing inclusion through five stages of practice: i) bonding with people you feel familiar with; ii) learning how to include yourself in practice; iii) gathering and developing information, often using technology; iv) becoming familiar with the surrounding environment – physical and virtual -; v) developing mobility within this environment.

Figure 1: The development of inclusive capital and a sense of inclusion: [verbal image] an image of five increasingly sized circles one within the other, with the five stages of inclusive capital in each circle.



1.2 The Nature and Aims of the Study

This report discusses the experiences of dancers, choreographers and those with visual impairment who worked collaboratively to develop a participatory dance, technology and choreography project called Sound Pad. The project was constructed and evaluated using a combination of participatory and grounded methodology, a practice framework of rationale method and the development of inclusive capital. This report aims to explore the development of this co-created sensorially and intellectually inclusive education and performance through the experiences of dancers-as-teachers, and how this experience informs these dancers' practice. In addition, it is designed to examine the commissioning of public dance performance as a means of inclusive public education, and to make performance art more culturally diverse.

The Sound Pad project had four objectives, these were to:

- develop a participatory dance technology, collaborative choreography and a method of teaching dance, movement and embodiment primarily through residual vision, sound and touch using rationale methodology
- encourage people with visual impairment to move more, to feel more included in mainstream dance culture and develop a greater sense of inclusion
- have a greater understanding of dance as a performative art form and a public art form
- to examine the encouragement of artists in their use of a multi-modal pedagogy as a tool of teaching people with disabilities through different senses – vision or residual vision, hearing and touch in combination with music and language as a mediator.

At the end of the project, the results of this endeavour were shown at a public event in Sheffield City Centre, where participant dancers performed the work of participant visually impaired choreographers.

“The project was constructed and evaluated using a combination of participatory and grounded methodology, a practice framework of rationale method and the development of inclusive capital.”

1.3 Outline of the Following Report

The following report of the study is broken into the following five sections: 1) the context of the Sound Pad project, and the background of the models of practice and analysis; 2) the research and practice methodology, which was based on grounded methodology and participatory practice ; 3) the analysis of observations and feedback of the three phases of the project; 4) conclusions and recommendations drawn from the study.

2 The Context of Sound Pad

As stated above, the method of practice used to develop the Sound Pad was the rationale method. This method consequently aimed to develop inclusive technical capital / inclusive capital in both the participant dancers and visually impaired participants during the project. This method and model of human capital and inclusion is now discussed below in separate sections.

2.1 The Origins and Development of Rationale Method[1]

The rationale method was initially developed after Nathan Geering contacted SNS Bradford (a part of Bradford City Council's Providion for providing services for community groups for people with visual impairments) and began working with visually impaired director, Andrew Loretto, to explore accessibility in breakdance. Loretto and Geering previously worked at Sheffield Theatres and CAST in Bradford. Loretto then suggested inviting playwright Kaite O'Reilly to work on a project, and both Loretto and O'Reilly worked on a residency with Rationale.

During this residency and through consultancy with Sheffield Royal Society for the Blind and those responsible for visual impairment at Rotherham Council, four significant issues were established:

1. they weren't just investigating visual impairment but different ways of conceptualising the world
2. there are very few visually impaired breakdancers. Thus, there was a gap that needed addressing
3. many people with visual impairments find audio description uninteresting. Thus, there was a need for audio description to be made more accessible and enjoyable
4. few people with visual impairment in this part of South Yorkshire went to the theatre, as they found performances inaccessible

Further research by Rationale appeared to reveal that there was a need for an initiative to engage with people with visual impairments in order to raise an awareness of and an interest in dance. During this research, it was also observed that:

- dance movements by people with visual impairments needed to be very dynamic as intricate movements are difficult to detect
- many people with residual vision tend to see things better when they look down towards the floor

"… research by Rationale appeared to reveal that there was a need for an initiative to engage with people with visual impairments in order to raise an awareness of and an interest in dance."

Following this research, Geering hypothesized that breakdancing (b-boying) would be a particularly relevant method of dance for people with visual impairments, as it is extremely dynamic and much of its movement happens down at ground level.

Rationale then expanded its research in this area, in particular focusing on the accessibility of three different dance forms: ballet, contemporary dance and breakdance. During this work, people with visual impairments watched these different dance styles – without musical accompaniment, which it was felt could have influenced their experience – and then answered specific questions about the accessibility of each form of dance. The participants' answers seemed to confirm that breakdance was the most accessible of these three forms.

Following this research, Rationale developed a form of audio description through beat-boxing to provide a richer soundscape and stimulate the imaginations of visually impaired

[1] This section is adapted from the article, Geering, N. (Summer 2017). Breakdance and visual impairment. Animated magazine, pp. 19-21.

audiences. Rationale named this the Rationale Method of Audio Description (rationale method). To complement the rationale method, Rationale also worked on a new form of notation, similar to Labanotation.[2] This notation had specific sound effects matched to certain movements to ensure the highest level of accuracy during audio description of dance performances. This method of audio description is now made available to professional theatre companies and television and film productions.
Breakdance is also potentially a valuable life skill for people with visual impairments, as it greatly improves spatial awareness and acts as a form of injury prevention - it is a method of 'falling with style.'
Rationale argue it is extremely important to find ways of bridging the gap between sighted and visually impaired artists and audiences, to develop cultural inclusion. Rationale also argue that understanding visual impairment has enhanced the lives of breakdancers, as it flips their way of thinking to explore creativity. In addition, it unlocks new possibilities by altering dancers' vision and their perceptions of themselves.
More recently, rationale method has been explored by professional dancers, actors, painters and writers throughout the UK. It has also been used to enhance productivity within businesses, as it offers a technique for directors, managers and team members to utilise different view points and perspectives in highly productive ways.

2.2 Models of Learning Through Developing Human Value

During previous research, it was observed that philosophies of human value evolved chronologically since the Enlightenment.[3] Furthermore, human value, referred to as intangible skills and habits by Bourdieu[4] and Yardi[5], was felt to be an effective way of understanding our personal knowledge, activities, practices and skills. These variables were also thought to influence how these elements shape our personality, memory, and characters. Likewise, since the eighteenth-century writers have theorised that human values shape individual identity, behaviour, motives and desires and shape informal knowledge.[6] These previous philosophies of human values have a common theme: they value a sense of inclusion for a category of people as part of our human condition to feel part of a network. That is to say, they hypothesise the value of family, friends, social class, religion, and ethnicity as a community. Subsequently, these philosophies appeared to show networking and learning were instinctive – i.e. although there are better and worse ways of networking and learning and we might be encouraged to use one way over another, because we are not specifically taught to network and learn, we simply network and learn on our own. Networking and learning are therefore arguably part of our human condition of developing a sense of inclusion.

2.3 Bourdieu and Yardi's Model of Capital as Knowledge and Habits

Yardi's model[7] of technical capital, which itself evolved out of a model of cultural capital, demonstrated it is not only important to get information and use it to feel included. Information is part of our human history to develop and use technologies and the arts, just as it can also be said to be part of our history to seek out our heritage and the heritage of others.
Thus, cultural capital, such as that described by Bourdieu,[8] can also be knowing when to use certain types of language, such as internet jargon, and with whom certain language is socially and culturally acceptable.

[2] Hutchinson, A. (2013). Labanotation. Encyclopædia Britannica. https://www.britannica.com/art/labanotation (accessed 14th February 2020).
[3] (Hayhoe, 2019, ibid.)
[4] Bourdieu, P. (2010). Distinction. London: Routledge Classics.
[5] Yardi, S. (2009). Social Learning and Technical Capital on the Social Web. ACM Crossroads, 162(0), 9–11.; Yardi, S. (2010, February). A theory of technical capital. Paper presented at The TMSP Workshop, Georgia Institute of Technology, Georgia, US. Retrieved from http://tmsp.umd.edu/position%20papers/Yardi-SocialMediatingTech.pdf
[6] (Hayhoe, 2019, ibid.)
[7] (Yardi, 2009, ibid.)
[8] (Bourdieu, 2010, ibid.)

More controversially, human capital is our moral knowledge, such as our rules about how to exclude others who don't fit our own rules of social acceptability. It could also be said that it is part of our human character to seek out inclusion as a value to feel our sense of inclusion, and this inclusion fosters our sense of value.[9]
Consequently, to develop inclusive technical capital / inclusive capital – i.e. the way people with disabilities acquire habits that develops and maintains inclusion - can also then be central to our human history, as it provides us with a sense of value.

"… since the eighteenth-century writers have theorised that human values shape individual identity, behaviour, motives and desires and shape informal knowledge."

During this project, it was felt that acquiring inclusive technical capital / inclusive capital was especially important for people with visual impairments. This was largely because, people with visual impairments are more likely to find barriers to accessing inclusive capitals, as their opportunities for learning, gathering information and gaining access to spaces and places in the community are often restricted by their impairments or social attitudes.[10] This can potentially lead to a lessening of a sense of inclusion in mainstream society, and to a growing sense of social exclusion and isolation. For instance, previous research observed that people with visual impairments often found it harder to access technologies in cultural settings, or to access the environments of cultural institutions and public artworks.[11]
The physical nature of visual impairment can also lessen our access to acquiring inclusive technical capital[12] / inclusive capital.[13] For instance, acquiring visual impairment later in life can make it harder to join group discussions that are an essential part of networking for gaining information or using technology. Furthermore, some people who have visual impairments often do not learn Braille or identify themselves as being disabled. Visual impairment may also make it harder to find transport or physical networks of friends and family. Late acquired visual impairments can similarly be thought to restrict access to mainstream learning, and the spaces and places of cultural institutions that people once enjoyed, such as the theatre.

2.4 The Application of the Rationale Method and Inclusive Technical Capital / Inclusive Capital to the Project

Sound Pad set out to customise an existing music technology, converting it to a multi-sensory accessible educational and performative instrument. This would allow people of all ages and sight levels to choregraph through rationale method. The technology was thus programmed with an audio language of onomatopaic sound effects that most accurately helped people to imagine a variety of dance movements. The technology was to have clear tactile buttons that would allow people with visual impairments the opportunity to easily differentiate between buttons that corresponded to specific sound effects through touch, sound and residual vision. The

[9] (Hayhoe, 2019, ibid.)
[10] WHO. (2001). International classification of functioning, disability and health: ICF. Geneva, Switzerland: World Health Organization.
[11] Hayhoe, S. (2014). An enquiry into passive and active exclusion from sensory aesthetics in museums and on the Web: Two case studies of final year students at California School for the Blind studying art works through galleries and on the web. British Journal of Visual Impairment, 32(1), 44-58.; Hayhoe, S., Roger, K., Eldritch-Boersen, S & Kelland, L. (2015). Developing inclusive technical capital beyond the Disabled Students' Allowance in England. Social Inclusion, 3(6), 29-41.
[12] Hayhoe, S. (2019a) Inclusive Technical Capital in the Twenty-First Century. In Halder S., Argyropoulos V. (eds) Inclusion, Equity and Access for Individuals with Disabilities. Singapore: Palgrave Macmillan. pp. 223-241. https://doi.org/10.1007/978-981-13-5962-0_11
[13] (Hayhoe, 2019, ibid.)

Sound Pad project also set out to bridge the gap between sighted and visually impaired artists and audiences in the following ways:

- It was to enable people with visual impairments to communicate their choreographic ideas and movements through sound effects and choreographic methodology
- It was to enable dancers with visual impairments to be choreographed more efficiently and to make it possible to design ensemble choreography for groups of visually impaired dancers
- It was to enable people with visual impairments and no experience of choreography to be taught to become choreographers through rationale method and the use of this technology to develop inclusive capital
- It was to enable people with visual impairments to be taught to choreograph remotely from their home, develop inclusive technical capital / inclusive capital and send the sound file to the dance studio for the dancers to interpret. This was to make dance choreography more accessible to people with visual impairments who find it harder to travel to new places
- It was to enable sighted and visually impaired people to use the Sound Pad to either choreograph or to be choreographed, thus promoting the inclusion of sighted and visually impaired dancers and inclusive technical capital / inclusive capital.

3 Research and Practice Methodology

3.1 Grounded Methodology

The methodology used to develop and evaluate the project was a combination of grounded methodology[14] and participatory practice.[15] This methodology focused specifically on the co-creation of technology, choreography, dance and learning and was originally developed during arts-based studies of inclusion and technological development some three years ago. Grounded methodology in particular is an evolution of a more traditional methodology called grounded theory.[16]

Like grounded theory, grounded methodology with participatory research is conducted using three phases of data coding and practice, formally referred to as open (first), axial (second) and selective (third) phases - although these technical terms were not relevant in this study, with the phases being numbered alone.

During the first phase, categories of observable processes and practices are identified, and theories of analysis begin to emerge. This provides a focus for the research. For example, in previous research using this methodology, learning environments and practices were classified according to access preferences to examine and develop appropriate technologies for learning support.[17]

During the second phase, links between variables in individual categories of practice are connected together and developed into a unified epistemological model or paradigm that can be tested. In addition, if grounded methodology is used for a study of a course or workshop, as it was in this project, this linkage is done for practical purposes and provides a direction for evaluation. Between the second and third phases, an initial, testable hypothesis is then developed. During the third phase, testable evidence is used to interrogate the initial hypothesis - this data can include a workshop, course evaluations, a structured exercise or further phases of data collection and the re-development of participatory practice.

Like grounded theory, during the three phases of analysis data is also analysed in a progressively more focussed way and all forms of data are treated as being equally important. This system of data analysis suits the reflexive, problem solving approach to novel cultural contexts and topics, such as those found in this project, and triangulates different forms of data, data analysis and collection methods.

As with grounded theory, grounded methodology also constantly compares data, refines its methodology as it progresses and regards all forms of data collected during the project as equally important, valuable and useable. This flexible approach to data collection suited the Sound Pad project's reflexive, problem solving approach to new contexts, topics and settings, which were previously unrecognized, under-scrutinized and under-investigated. In addition, like grounded theory, grounded methodology data and theoretical approaches can also be stored for later analysis during different projects where they have more relevance.

There are differences between grounded theory and grounded methodology, and these differences were relevant in this project. For example, unlike grounded theory, grounded methodology encourages the evolution of culturally constructed theories in the style of

[14] Hayhoe, S. (2012). Grounded theory and disability studies. Amherst, New York: Cambria Press.; Hayhoe, S. (2019). Cultural heritage, ageing, disability, and identity: Practice, and the development of inclusive capital. Abbingdon, UK: Routledge.

[15] Hayhoe, S. & Garcia Carrisoza, H. G. (2019). Accessible Resources for Cultural Heritage EcoSystems (ARCHES) Deliverables 2.4: Recommendations, Guidelines & Policy Briefing. Vienna, Austria: ARCHES.; Hayhoe, S. (2019). River is the Venue (RiV): Evaluation of the Public Engagement Project, Involving Artists, Educational and Arts Agencies Working Collaboratively to Educate the Public on The History of Flooding in Bath Through Accessible Public Artworks. Bath: University of Bath.

[16] Glaser, B. G., & Strauss, A. L. (1967). The discovery of grounded theory: Strategies for qualitative research. Chicago, IL: Aldine.

[17] (Hayhoe & Garcia Carrisoza, 2019, ibid.)

Geertz's[18] cultural anthropologies, and collects and analyses the data largely asynchronously – the data is thus pre-defined, as was the nature of the study in the original proposal for the Sound Pad. In addition, in grounded methodology analysis is conducted using combinations of deductive and inductive logic[19] - i.e. reflections are worked through logically for an answer, and then followed by social and cultural hypothesis testing.
There are also practical differences between grounded theory and grounded methodology. Most notably, grounded methodology relies less on formal coding, and relies more on narratives developed by the researcher in order to state an original problem. Subsequently, these narratives are presented either as a thematic analysis, case studies or a combination of both. Grounded methodology is also applicable to non-traditional research studies, such as the design and evaluation of learning or structured literature searches.

"This flexible approach to data collection suited the Sound Pad project's reflexive, problem solving approach to new contexts, topics and settings, which were previously unrecognized, under-scrutinized and under-investigated."

3.2 The Ethics, Data Collection and Preparation of the Research and Practice
Prior to the development of the project the Royal National Institute for the Blind, Sheffield Royal Society for the Blind and SNS Bradford were contacted in person, and members of these societies were recruited as volunteer participants either for the learning phase of the project or to provide feedback via these organisations. It was planned to recruit twenty participants of mixed ages to take part in the education, feedback and technology elements of the project – N.B. for ethical reasons it was decided not to recruit young children who would not understand the nature of the project or breakdancing. Twenty-one participants eventually took part in the project.
The project focused on recruiting younger people for the educational elements of the project in particular, as it was hoped the educational outcomes would have particular resonance and impact in schools. However, people of all ages were asked for feedback about the technology and choreography, as it was envisaged that these elements should be as inclusive and wide-ranging as possible.
As well as recruiting participants, before starting the project a suitably inclusive technology was sourced. This technology had to include sound, vision and touch – vision was included for people with residual vision and sighted people. Eventually, an Ableton Novation Launchpad (the Launchpad) was bought.
This sound pad was chosen as it was relatively easy to teach, it could be connected to a laptop via a cable, voice samples could be loaded, and the actual instrument was a simple square device with sixty-four buttons arranged in a useable eight-by-eight array of square, good-sized buttons – although the instrument also had other buttons and knobs arranged around the outside to program the device, the participants would not need these to develop dance choreography. More usefully, when the Launchpad was turned on it lit up, and each button could be programmed as a simple white light or a different colour, making it perceptible to people with residual vision.
In addition, a similar but simpler sound pad, an AKAI Professional LPD8 (the LPD8) was sourced. This was similar to the Launchpad, but had only eight buttons in an array of four-by-two, for participants who preferred a

[18] Geertz, C. (1989). Works and lives: The anthropologist as author. Palo Alto, CA: Stanford University Press.
[19] Popper, K. (1959). The logic of scientific discovery. London: Hutchinson & Co.

Popper, K. (1979). Objective knowledge: An evolutionary approach (Rev. ed.). Oxford: Clarendon Press.

simpler device. This again had buttons and knobs around its sides for programming and volume adjustment, but these did not need to be used during the development of choreography.

Importantly, the methodology was informed by the British Educational Research Association's guidelines on ethical research.[20] In accordance with these guidelines, it was a requirement that any participant in the project, whether they were a learner, a dancer, a choreographer or a participant who provided feedback had to provide informed consent – i.e. they were either read or could read for themselves an A4 sheet describing the project and telling them their role in the project, how the data was to be used, that their participation and all datum were anonymous, what the project hoped to achieve and their right to withdraw their participation or their data from the project at any time. During the project, no participants withdrew. In addition, during the project no coercion was applied through incentives or payment – i.e. participation was *pro bonum*.

During the project, there were two types of data collection: 1) participant observations[21], some of which were voice recorded, photographed or videod with mobile phones (iPhone and Samsung J4); 2) interviews with participants using the following questions – these interviews were recorded using an iPhone, as the sound files could be easily fed back to the interviewees:

Opening questions

I'd like to start by asking you about your background to provide context.

1. Could you please tell me your age?
2. Could you please tell me your experience of dancing?
3. Could you please tell me if you have always been visually impaired or had a visual impairment from birth or when you were born?
4. Could you please tell me if you have some vision, or if you have no vision?
5. Could you please tell me if you have any other access need, such as help with walking or hearing?

Context of your use of technology

Can you please tell me about your use of technology.

1. Do you use a PC – with a keyboard / mouse / touchpad – a tablet computer and a mobile telephone?
    a. Do you use specialist tactile keyboards or sound interfaces, such as JAWS or tactile keyboards?
2. Do you use computers to make music?
3. Do you use computers to communicate with other people?
4. Do you program or code computer programs?

Context of dancing

Can you please tell me about your experience of music and dance:

1. Could you please describe your experience of music?
    a. Do you attend concerts or clubs?
    b. Do you only listen to music at home?
    c. Do you perform music?
2. Do you dance?
    a. If you dance, do you dance at home or in clubs or public dances?
    b. Do you perform dance, or have you ever performed a dance in public?

Attitudes towards the Soundpad

1. If you have tried the Soundpad today, did you find it easy to use?
    a. Did you find it easy to use, and if so why?
    b. Did you find it interesting to use?
2. Would it be something you would like to use?
3. Can you see a benefit to using the Soundpad to plan a dance?
4. Do you identify anything we could add to the Soundpad?
5. Is there anything we could add to the Soundpad to make it easier to use?
6. Do you prefer a tactile interface?
7. What else could we do to change or program the Soundpad to make it

[20] BERA. (2018). Ethical guidelines for ethical research (4th edition). London: British Educational Research Association.

[21] (Hayhoe, 2012, ibid.)

more user friendly?

Closing questions

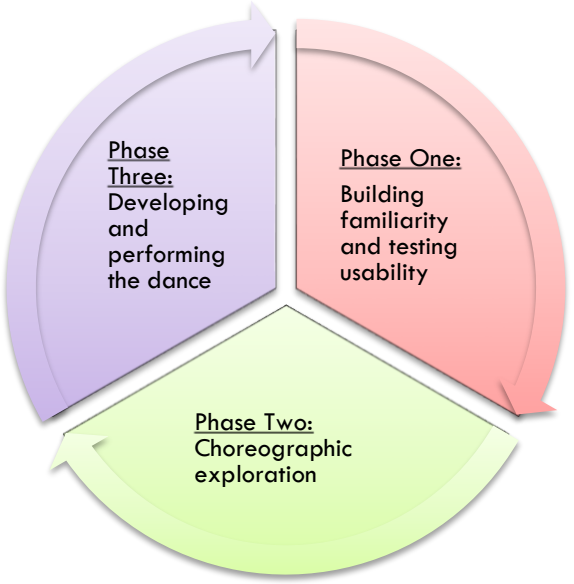
1. I appreciate the time you took for this interview. Is there anything else you think would be helpful for me to know?
2. I should have all the information I need. Would it be alright to call you if I have any more questions or need clarification?

In accordance with ethical guidelines, and the promise of participant anonymity in particular, only images of the objects made during classes and Nathan Geering (co-author) can be reproduced in reports, presentations or publications resulting from this project. The images, videos and sound files of the participants recorded during observations were subsequently only used to analyse and log the development of the project, and were downloaded and kept on a securely locked computer with password protection. Additionally, any personal data about the participants are due to be destroyed six months after the end of the project.

As stated above, after preparations for the project were complete, the practice and analysis were to be conducted in three phases. The plan for these phases are summarised in Figure 2.

"In accordance with ethical guidelines, and the promise of participant anonymity in particular, only images of the technology and objects made during classes can be reproduced in reports, presentations or publications resulting from this project."

Figure 2: Outline of the Stages of Practice and Analysis Used During the Project: [verbal image] an image of a circle split into three parts is displayed, with arrows showing the direction of the project in each part as it progresses. Each of the three parts of the project has a different colour, either red, green or mauve. The last arrow points to the beginning of phase one, making the process on-going.



Phase one: Familiarising and testing the technology and Rationale Method

Participants were to begin by familiarizing themselves with the rationale method language, the Launchpad and the LPD8. After these sessions, feedback was to be sought on both the method and technologies. The feedback and observations of sessions were then to be evaluated, modifications were to be made to the teaching and additions or modifications designed to improve the usability of the technology as necessary.

Phase two: Choreographic exploration

Participants who express an interest in choreography will be invited to start to choreograph movement sequences using the Launchpad and LPD8. Each participant will have a set amount of time to choreograph a section of movement during each half day session (four sessions in total). At the end of each session. This process is to be constantly evaluated and observed to see if movement is effectively communicated to the dancers. If needed, communication is to be further

refined during this process to ensure movement and instructions are clearly understood. At the end of this process, the technology, learning and choreography are to be more thoroughly evaluated and an initial hypothesis will be created.

Phase three: Developing and performing a dance co-created by the participant choreographer and dancers

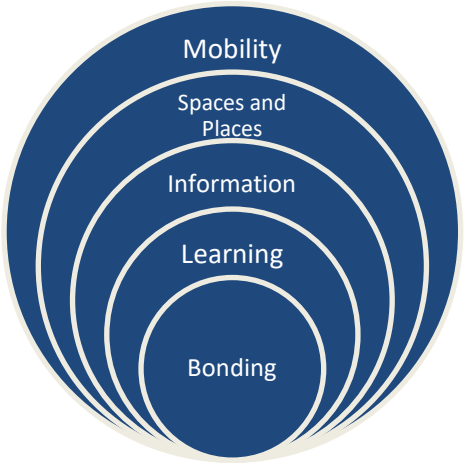
A performance will then take place to test the hypothesis, and feedback will be sought. For those who struggle to leave their home, the choice of using the Launchpad to record audio sequences at home will be provided.

4 Analysis of the Three Phases of the Project Using Inclusive Technical Capital / Inclusive Capital

4.1 Initial Tasks in the Development of the Project

As stated above, inclusive technical capital / inclusive capital is developed through the enhancement of five elements or stages of inclusion. These are illustrated in figure 3 below. During the following evaluation of the practice, this model is used as a framework of analysis, as its aim was to develop this form of human capital through co-creation of learning, choreography and technology. In this analysis, individual elements of inclusive technical capital / inclusive capital will be emboldened to emphasise how and where it was developed during this project.

Figure 3: The development of inclusive capital and a sense of inclusion: [verbal image] an image of five increasingly sized circles one within the other, with the five stages of inclusive capital in each circle.



All three phases of practice took place during sessions at the Sheffield Royal Society for the Blind, SNS Bradford and 108 The Moor (Sheffield City Centre); and these three phases were subsequently split into children's and adult's participatory sessions. The sessions were all led by Nathan Geering and altogether included five children and sixteen adult participants. Sessions were based on groups that allowed **bonding** in familiar Sheffield and Bradford **spaces and places** between the participants and between Rationale and the participants. The dates and times of these sessions were as follows, and sessions were booked at the convenience of the venues and participants. Therefore, they did not follow a strict time pattern:

Children's Sessions:

- 13th & 17th December 2019, 16.30-18.30
- 17th, 24th & 31st January 2020, 16.30-18.30
- 7th February 2020, 16.30-18.30
- 15th February 2020, 11.30-14.30
- 17th & 18th February 2020, 10.00-16.00

Adults' Sessions:

- 17th & 24th January 2020, 13.30-14.30
- 20th January 2020, 10.00-12.00
- 7th February 2020, 13.30-14.30

The children's sessions were used to develop **learning** about **mobility** and the **space** through dance, to generate **information** through familiarization with the Launchpad and LPD8, to learn choreography and breakdancing, to make representations of **mobility** that could subsequently be used to develop the technology and to provide general feedback about the technology and the learning – thus, all the participants had importance as co-creators of learning through this knowledge gathering and **information** generation process. The same was to occur between participants in the adult sessions, where participants used the Launchpad and LPD8 then discussed what they would like to see from the technology and learning sessions, fed back on their own experiences of dance – as participants and as an audience - and provided feedback on the use of the Launchpad and LDP8.

4.2 Implementing Phase One

In the first phase of practice, samples of onomatopaic sounds representing individual dance moves were recorded and uploaded to the Launchpad and LPD8. Participants then attended sessions to familiarize themselves with the technology, the samples used and the notion of developing choreography with a visual impairment – this phase took place asynchronously; i.e. the adults started this phase a month after the children were

introduced to the technologies. Feedback on the usability of the Launchpad and LPD8 was then gathered from participants.
During this phase, Geering also started teaching participants how to use the technology, the nature of choreography and the design of dance movement through rhythm. It was observed that rationale method could help develop many elements of inclusive technical capital / inclusive capital. For instance, the children demonstrated they could imagine **mobility** and their own bodies in **space** and **place**, **learnt** to link this embodiment to the samples of dance moves and were happy to synthesize **information** about the Launchpad on their own to suggest improvements to the technology.

*"… the children demonstrated they could imagine **mobility** and their own bodies in space (i.e. their **environment**), **learnt** to link this embodiment to the samples of dance moves and were happy to synthesize **information** about the Launchpad …"*

For example, in order to develop the technology and to teach the children dance moves through embodiment, the children were asked to create representations of body movement in playdough. These playdough representations were then used to design shapes on clear buttons for the Launchpad to provide **information** and facilitate **learning** through a combination of touch, vision, sound and language as a mediator[22]. An example of these playdough figures are shown in figure 4 below.

Figure 4: The development of dance movement symbols: [verbal image] An image of ten different sized playdough figures of dance moves. They range from twirl shapes and small pieces of playdough in a circle to reprensentations of a person with their legs split. The pieces are coloured with pure colours of purple, blue, yellow, green and red.

From these playdough pieces, symbols were developed with the participants through co-creation that could be used as tactile **information** and the basis for new **learning**. These tactile elements thus became the basis of raised buttons that could be fixed to the Launchpad and LPD8. Examples of these figures with their meaning are shown in figure 5.

[22] Hayhoe, S. (2018). Classical Philosophies on Blindness and Cross-Modal Transfer, 1688-2003. In J Ravenscroft (ed.), The Routledge Handbook of Visual Impairment: Social and Cultural Research. (pp. 227-237). Abbingdon, UK: Routledge.; Hayhoe, S., Cohen, R. & Garcia Carrisoza, H. (2019). Locke and Hume's philosophical theory of color is investigated through a case study of Esref Armagan, an artist born blind.' Journal of Blindness Innovation and Research, 9(1): 1-9.

Figure 5: Examples of the development of breakdance moves in playdough: [verbal image] Below are two images, one after the other and representing different sized playdough figures of named dance moves. The first image represents playdough figures of a slice – a dance move. There are six playdough figures on a table. The figures are long and thin, some split. They are coloured yellow, purple, red, green and light blue. The second image represents the figures of a bounce – another dance move. There are three figures, each of which is round and some are like chubby human figures, set out on a table top. They are coloured purple, green and yellow.

4.3 Implementing Phase Two

In phase two, an initial evaluation of the feedback and observations during these early sessions showed a positive response to the Launchpad and and LPD8 and the possibility of generating choreographic exploration exercises during the following sessions. The only issue that arose was that some participants found the Launchpad had too many buttons, and found it hard to use such a large array to learn choreography. Thus, for some novice users in particular, it was felt that using LPD8 to teach choreography would be less intimidating.

During analysis of interviews and observations it was also observed that participants liked music – some performed music – and **bonded** through music. In addition, participants had previous experience of technology, they all had mobile phones and all felt generally comfortable using technology. However, the participants had little or no experience of performative dance, especially dancing in public. Subsequently, it appeared that the participants were more comfortable using the Launchpad as a **learning** mediator and as a means of co-creating dance **information** through the language of music as it was a familiar art form – the users appeared particularly comfortable using the rationale method as music, as it proved generally easy to memorise after the initial sessions.

At the beginning of phase two, three participants also volunteered to work as choreographers with five participant dancers, and attended further sessions to start designing movement sequences using the Launchpad and LPD8. At this point, tactile representations of the dance moves designed in phase one were molded into clear buttons and represented through raised shapes. These buttons were then stuck to the built-in buttons on the Launchpad and LPD8 with glue dots to trial this new system during choreography sessions.

Despite initial worries about possible confusion in **learning** choreography at the beginning of the project, as the sessions progressed and participants got to know eachother, the sighted and visually impaired participants **bonded** as a group and appeared to develop a clear rapport. During the logs of later sessions in particular, it was noticeable that any miss-understandings and tensions caused by new forms of **learning** were overcome through frank conversations.

Participants in particular appeared to be more honest with eachother at this stage, accepting criticism and speaking freely, and subsequently the learning became more refined. Small changes in these latter stages of **learning** also appeared to make big differences to the development of choreography, and this new honest approach helped accelerate the process of communication and the co-creation of dance **information**. For example, as one dancer explained:

> "What was really interesting was that I didn't know his idea of a step was my idea of a step. We had to ask eachother 'is the the kind of step you mean.' So, we had to get involved more than choreographers would usually. The [technology] helped a lot."

Consequently, the testable hypothesis formed at the end of phase two of the project was that:

> *once clear communication processes have been confirmed, the dancers can more easily choreograph the performance piece.*

"What was really interesting was that I didn't know his idea of a step was my idea of a step. We had to ask eachother 'is the the kind of step you mean.' So, we had to get involved more than choreographers would usually."

4.4 Implementing Phase Three

In the final phase of the process the development of a choreographed sequence that could be used as a form of communication about **mobility** and **space** and **place** appeared to have been developed. During observations in the latter February session at 108 The Moor, for example, clear dance sequences that could be performed had been devised using rationale method, the Launchpad and the LPD8 and the dancers worked together to produce a synchronized breakdance. An example of one of these dance steps in illustrated in figure 6, and performed by Geering.

Figure 6: An example of a breakdance move choreographed by a participant and performed by Nathan Geering: [verbal image] Nathan is moving in time to music. He is a tall man wearing blue jeans, dark coloured trainers with red laces and a baggy purple sweatshirt with a yellow teddy bear design on the front. He is about to spin, and one arm is outstretched to the front of his body whilst another is outstretched behind him.

Unfortunately, in mid-late February 2020, the initial public performance of these dances had to be postponed, as wide-spread storms and flooding restricted travel and public attendance. However, on the 21st February the choreography was performed at Derby Theatre to an audience of around 65 people. Feedback from the evening was universally positive about the performance, choreography and the work between and within the group. For example, one audience member stated:

> "The sounds effects gave me a better understanding of dance moves and made the the performance really enjoyable."

Whilst another audience member stated:

> "I have never seen a show use accessibility in this way and thoroughly enjoyed it."

In addition, the participant dancers also provided universally positive feedback about their experiences of working with the participant choreographers, and emphasised how the technology helped them alter their own understanding of **mobilty** and **space** in an innovative way. For example, one dancer explained:

> "The [technology's] really good. It's easy enough to understand what [the choreographer] meant. You already had a vision of what he already wanted. And, with feeling and touching the [technology], he was able to understand what our movements were to give him a clearer idea."

Another dancer explained that the participant choreographer had challenged her expectations of what to expect from the process of designing breakdance movements and sequences. However, she also felt that the participant had an image of what he wanted to achieve and communicate:

> "The process has been really interesting. I found that working with [the choreographer] he really seems to know what he wants. You can tell he's got a vision of what he's trying to portray. And, he's not taking long to throw down what he actually wants."

Furthermore, the dancers universally felt that they had gained a personal understanding of the capability of visually impaired people beyond the creation of their breakdance routines as a result of working with the participant choreographers. They also described wanting to expand their experiences of working on the project to create a sustainable model of **learning** and co-creation:

> "It's been really nice as a dancer to be creative with [the choreographers] and to create a routine … I didn't know what to expect, but I feel very privilliged to be a part of it. Let's keep going with this, because I'm very excited to see what the future holds."

5 Conclusion and Recommendations

5.1 Conclusion

The Sound Pad project has created a unique form of co-creating, choreographing and **learning** about dance sequences through imagining **mobility** and **space**, and through the co-creation of **mobility**. Furthermore, all the participants developed new negotiated forms of **information** that helped them **bond**, share ideas and subsequently evolve a form of mutual inclusive technical capital / inclusive capital.

In addition, visually impaired participant choreographers showed that it was possible to imagine dance sequences creatively through touch, sound and residual vision and then communicate this vision to sighted dancers in an effective way. There were challenges to this process, and some dancers felt it was initially difficult to understand if what they imagined was the same as the participant choreographer. However, this confusion quickly discipated as the sessions progressed, and both the participant dancers and choreographers appeared to evolve mutual respect and comprehension of eachother's abilities. The technology and the rationale method of describing onomatopaic sound and movement therefore seems to have particularly helped this process of communication.

"… confusion quickly discipated as the sessions progressed, and both the participant dancers and choreographers appeared to evolve mutual respect and comprehension of eachother's abilities."

5.2 Recommendations for Future Action

Given these findings, the authors of this report recommend three recommendations for future action:

1. The participatory practice and co-creation element of the project needs further validation with different audiences, dance companies, environments and cultural settings. Although the process was largely successful in Sheffield and Bradford, further triangulation of these results will help to develop a more objective, culturally transferable method of working.
2. Likewise, the technology developed through co-creation and practice needs further testing in different settings and with different members of the visually impaired community. In particular, the technology at present has not been tested with participants with multiple disabilities. For example, can the rationale method help communicate the imagination of those on the autistic spectrum or those with learning difficulties?
3. The lessons learnt from this project, and particularly the development of the rationale method and model of inclusive technical capital / inclusive capital, needs to be developed as a formal method of dance and music education. In particular, there is scope for dance educators to use the technology to inform their own practice and use dance to increase the awareness of disability arts and the capabilities of all learners to participate in performance art on an equal basis.

Centre for the Philosophy of Natural and Social Science
The London School of Economics
and Political Science
Houghton Street
London WC2A 2AE

Email: s.hayhoe@lse.ac.uk

lse.ac.uk/cpnss/people/simon-hayhoe

The information in this brochure can be made available in alternative formats, on request. Please contact: s.hayhoe@lse.ac.uk

Design: LSE Design Unit (lse.ac.uk/designunit)
Photography: Nigel Stead, LSE School Photographer.